



State of Utah  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS AND MINING

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August 6, 1996

TO: Lowell P. Braxton, Deputy Director

FROM: D. Wayne Hedberg, Permit Supervisor *DWH*

RE: Updated Reclamation Surety Estimate, Western States Minerals Corporation, Drum Mine, M/027/007, Millard County, Utah

In response to several written requests/demands from Western States Minerals Corporation (WSMC) for a release/reduction of their reclamation surety, the Division has prepared a *draft* revised surety estimate. The estimate has been tailored specifically to WSMC's remaining reclamation responsibilities at the Drum Mine (@41.52 disturbed acres). The reclamation estimate was prepared using computer software developed by the U.S. Bureau of Mines ("*HeapRec Program*") for calculating decommissioning and reclamation costs associated with closure of heap leach mining operations. This latest revised *draft* estimate is intended to replace the previous (6/26/95) *preliminary* draft (\$124,700) estimate as referenced in WSMC's September 12, 1995, and June 14, 1996, correspondence. As you will recall, the earlier (6/26/96) estimate was simply an escalation of the projected reclamation calculations prepared as part of WSMC's originally approved permit.

Because there are numerous *unknowns* regarding the present conditions of the heaps at the Drum Mine site, we had to make several assumptions. For example, because of the deteriorated condition of the plastic liners under the heaps and failure to permit the heaps, the Department of Environmental Health, Division of Water Quality (DWQ), will not allow the heaps to be rinsed and risk possible contamination of local water quality. Because we do not have hard data regarding the internal chemistry of the heaps (i.e., residual cyanide and metals concentrations), we must assume that a capping scenario for closure of the heap would be required. We also made assumptions regarding the actual dimensions (shape and height) of the heaps because we do not have site specific survey information or accurate maps of existing conditions. In order to get equipment on the heaps to apply and compact a clay cap, the out slopes of the heaps would need to be regraded to at least a 3H:1V slope angle. Because WSMC never successfully demonstrated that the heaps could be reclaimed without the application of topsoil, we assumed that one (1) foot of topsoil would be required on all regraded heap and waste rock dump surfaces to assure successful revegetation.

The resulting revised reclamation estimate, applying the standard 5 year escalation to year 200 dollars, totals \$746,000. This surety estimate is nearly three times higher than the amount of reclamation surety presently posted by WSMC (\$264,080). It is reasonable to assume that even under a *best case* scenario of heap leach pad conditions, it is very unlikely that the amount of surety necessary to decommission and reclaim WSMC's mine disturbances would be less than the present amount of surety. Until such time as the operator(s) is able to provide the Division with detailed information justifying a revision to the latest draft reclamation estimate (or Jumbo Mining Company posts full reclamation surety for the site), we would be ill-advised to consider a reduction or release of WSMC's \$264,080 reclamation surety.

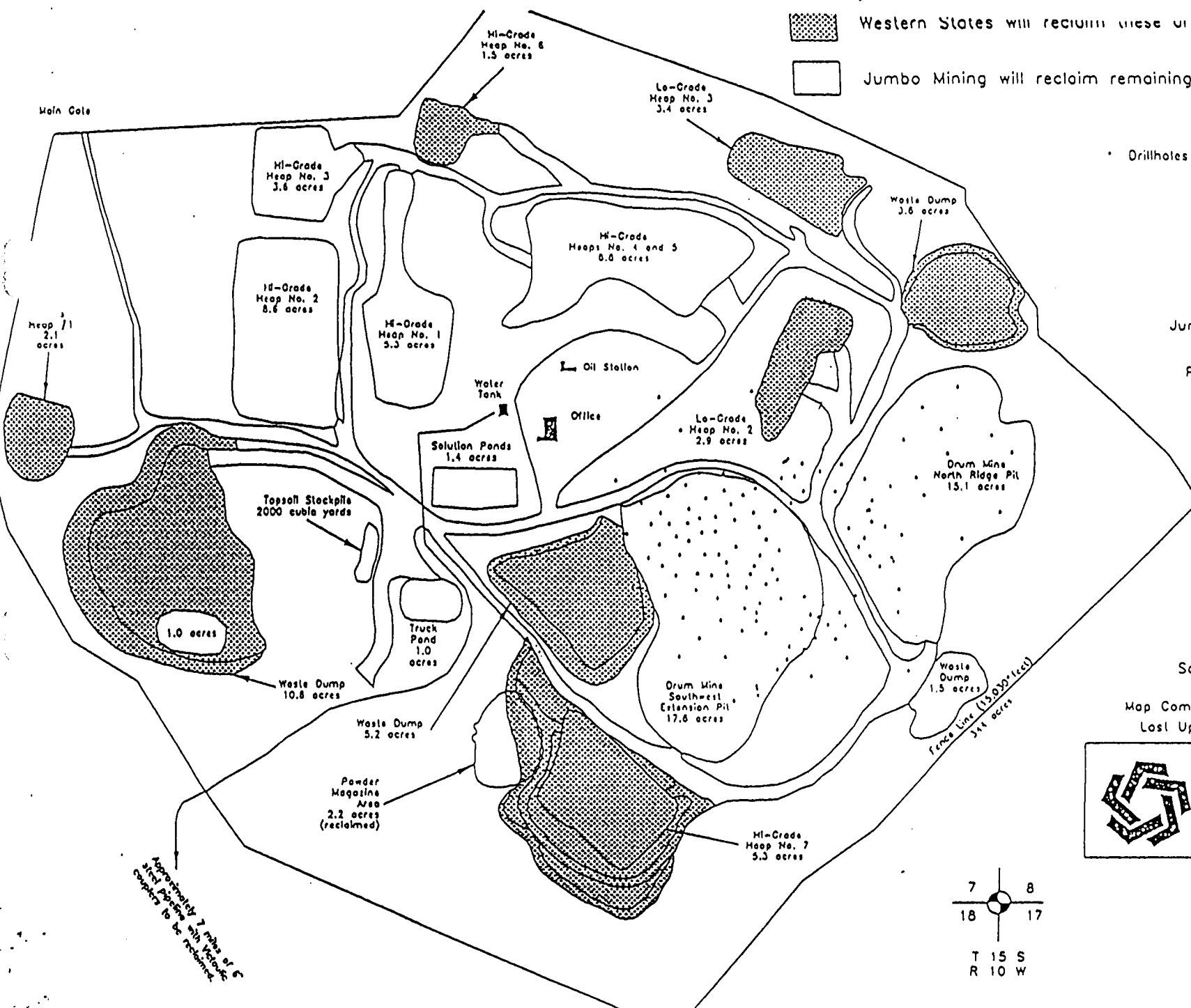
jb

Attachment - revised surety estimate  
wsmsur.mem

RECLAMATION ESTIMATE		Western States Minerals Corp		DRAFT																																																																																																																			
Drum Mine [WSMC's portion of the site]		last revision		08/02/96																																																																																																																			
M/027/007		Millard County		filename WSMC96A.WB2																																																																																																																			
				page "estimate"																																																																																																																			
Prepared by Utah State Division of Oil, Gas & Mining																																																																																																																							
<b>This estimate is for assumed reclamation of WSMC's part of the Drum Mine site ONLY</b>																																																																																																																							
-WSMC's Portion of Drum Mine (as listed on the DOGM map of July 26, 1989) includes:																																																																																																																							
LG1, LG2, LG3, HG6, HG7, WASTE 10.6 acres, WASTE 3.6 acres, WASTE 5.2 acres																																																																																																																							
-This estimate assumes heaps will be regraded to 3h:1v, capped, topsoiled 1 ft & revegetated																																																																																																																							
-This estimate assumes dumps will be regraded to 3h:1v, topsoiled 1 ft & revegetated																																																																																																																							
-This estimate assumes clay & rock are available as capping material within 1 mile of the site																																																																																																																							
-No reclamation of facilities is included in this estimate																																																																																																																							
-Areas & perimeter used in HeapRec for this estimate were from the July26, 1989 DOGM map																																																																																																																							
-See separate sheets for HeapRec calculations as indicated by the notes																																																																																																																							
-This is a rough estimate made without field verification of heap & dump heights																																																																																																																							
-Regrading heaps & dumps was assumed to increase their footprint area by 20%																																																																																																																							
-WSMC's total disturbance to be reclaimed = 41.52 acres																																																																																																																							
<table><tr><td><u>Description</u></td><td><u>Amount</u></td><td><u>\$/Unit</u></td><td><u>Cost-\$</u></td><td><u>Notes</u></td><td><u>heaprec</u></td></tr><tr><td>Regrade heaps to 3h:1v</td><td></td><td></td><td>57,929</td><td>(1)</td><td>B260+C26</td></tr><tr><td>Capping heaps (clay 1 ft, rock 1.5 ft)</td><td></td><td></td><td>331,188</td><td>(1)</td><td>B758</td></tr><tr><td>Hauling topsoil on heaps(1 ft depth of cover)</td><td></td><td></td><td>29,692</td><td>(1)</td><td>C356</td></tr><tr><td>Spreading toposil on tops (1/2 area)</td><td></td><td></td><td>2,441</td><td>(1)</td><td>C438</td></tr><tr><td>Spreading topsoil on slopes (1/2 area)</td><td></td><td></td><td>2,615</td><td>(1)</td><td>C460</td></tr><tr><td>Seed &amp; mulch heaps</td><td>18.24 acres</td><td>275</td><td>5,016</td><td>(2)</td><td></td></tr><tr><td>Regrade waste dumps to 3h:1v</td><td></td><td></td><td>103,680</td><td>(1)</td><td>B23+C23+</td></tr><tr><td>Hauling topsoil on heaps(1 ft depth of cover)</td><td></td><td></td><td>37,904</td><td>(1)</td><td>B356</td></tr><tr><td>Spreading topsoil on dump tops</td><td></td><td></td><td>3,113</td><td>(1)</td><td>B438</td></tr><tr><td>Spreading topsoil on dump slopes</td><td></td><td></td><td>3,263</td><td>(1)</td><td>B460</td></tr><tr><td>Seed &amp; mulch dumps</td><td>23.28 acres</td><td>275</td><td>6,402</td><td>(2)</td><td></td></tr><tr><td>Mobilization</td><td>6 equip</td><td>1000</td><td>6,000</td><td>(2)</td><td></td></tr><tr><td>Supervision</td><td>30 days</td><td>250</td><td>7,500</td><td>(2)</td><td></td></tr><tr><td colspan="3">SUBTOTAL</td><td>596,741</td><td></td><td></td></tr><tr><td colspan="3">ADD 10% CONTINGENCY</td><td>59,674</td><td></td><td></td></tr><tr><td colspan="3">DOGM ADJUSTED TOTAL IN 1996 DOLLARS</td><td>\$656,415</td><td></td><td></td></tr><tr><td colspan="3">Escalate for 5 years at 2.58% per year</td><td>89,161</td><td></td><td></td></tr><tr><td colspan="3">Total</td><td>\$745,576</td><td></td><td></td></tr></table>						<u>Description</u>	<u>Amount</u>	<u>\$/Unit</u>	<u>Cost-\$</u>	<u>Notes</u>	<u>heaprec</u>	Regrade heaps to 3h:1v			57,929	(1)	B260+C26	Capping heaps (clay 1 ft, rock 1.5 ft)			331,188	(1)	B758	Hauling topsoil on heaps(1 ft depth of cover)			29,692	(1)	C356	Spreading toposil on tops (1/2 area)			2,441	(1)	C438	Spreading topsoil on slopes (1/2 area)			2,615	(1)	C460	Seed & mulch heaps	18.24 acres	275	5,016	(2)		Regrade waste dumps to 3h:1v			103,680	(1)	B23+C23+	Hauling topsoil on heaps(1 ft depth of cover)			37,904	(1)	B356	Spreading topsoil on dump tops			3,113	(1)	B438	Spreading topsoil on dump slopes			3,263	(1)	B460	Seed & mulch dumps	23.28 acres	275	6,402	(2)		Mobilization	6 equip	1000	6,000	(2)		Supervision	30 days	250	7,500	(2)		SUBTOTAL			596,741			ADD 10% CONTINGENCY			59,674			DOGM ADJUSTED TOTAL IN 1996 DOLLARS			\$656,415			Escalate for 5 years at 2.58% per year			89,161			Total			\$745,576		
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Rounded surety amount in yr 2001-\$			<u>\$746,000</u>																																																																																																																				
Average cost per acre =			\$17,967																																																																																																																				
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(1) This value calculated using the USBM HeapRec program																																																																																																																							
(2) This value calculated by DOGM																																																																																																																							



6-20 1-




Western States will reclaim these areas (41.0 acres).

Jumbo Mining will reclaim remaining areas (83.9 acres).

Jumbo Mining Company  
M/027/007  
Drum Mine Site  
Present Disturbance

Scale: 1" = 600'

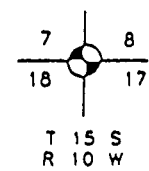
Map Compiled December 5, 1988  
Last Update: July 26, 1989



State of Utah

Department of Natural Resources

Division of Oil, Gas and Mining



Approximately 2 miles of 6  
inch pipeline will extend  
across to be reclaimed

M/027/007 8/5/96

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\* WELCOME TO HEAPREC - A TEMPLATE FOR HEAP LEACH \*

---DOZER - RECONTOUR HEAPS (1 of 1 page)---

	PAD 1	PAD 2	PAD 3	PAD 4
**HEAP CREST DISTAN	2520	1560	1080	3360 ft
**HEAP SLOPE ANGLE (	37	37	37	37 degrees
**RECLAIMED ANGLE (+)	18	18	18	18 degrees
**HEAP HEIGHT	60	60	60	60 ft
PCT GRADE FINAL	40	40	40	40 %
MATERIAL TO MOVE	73547	45529	31520	98062 cy
HAUL DISTANCE	87	87	87	87 ft
DOZER HORSEPOWER	370	370	370	370 hp
DOZER TYPE	D9N	D9N	D9N	D9N
OPERATING COST	\$223.35	\$223.35	\$223.35	\$223.35 per hr
LABOR COST	\$25.70	\$25.70	\$25.70	\$25.70 per hr
PRODUCTION	1337	1337	1337	1337 cy/hr
TOTAL TIME AT 80 PCT	68.8	42.6	29.5	91.7 hrs
DOZER-RECON HEAP C	\$17,135	\$10,610	\$7,347	\$22,838

NAME	AREA	EST. PERIMETER	HEAPREC ID
LG-1	2.1 ACRE	960'	PAD 1
LG-2	2.9 ACRE	1,560'	
LG-3	3.4 ACRE	1,560'	PAD 2
HG-6	1.5 ACRE	1,080'	PAD 3
HG-7	5.3 ACRE	3,360'	PAD 4

JOB EFFICIENCY FACTOR 83%

M/027/007 8/5/96

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\* WELCOME TO HEAPREC - A TEMPLATE FOR HEAP LEACH \*  
\*

---CAPPING HEAP (1 of 7 pages)---

\*\*\*\*\*  
\*\*HAUL DISTANCE - CLAY 5280 ft  
\*\*ACRES TO CAP 18.24 ac  
\*\*CLAY LIFTS (6 IN EACH) 2  
\*\*DRAINAGE LAYER 1.5 ft  
\*\*HAUL DISTANCE - ROCK 2640 ft  
  
CLAY THICKNESS 1 ft  
CLAY VOLUME 29427 cyd  
CRUSHED ROCK VOLUME 44141 cyd

TOTAL CAPPING COST \$331,188

---CAPPING HEAP, HAULING CLAY (2 of 7 pages)---

TRUCK TYPE	D30D	COST	\$53,288
CAPACITY	19.5 cy		
TRUCK SPEED	32 mph		
MANEUVER,DUMP TIME	2 min		
OPERATING COST	\$103.85 per hr		
LABOR COST	\$20.70 per hr		
LOADER TYPE	970F		
CAPACITY	4.25 cy		
LOAD,DUMP,MANEUVER TI	0.55 min		
OPERATING COST	\$92.15 per hr		
LABOR COST	\$25.70 per hr		
MATERIAL DENSITY	95 lb/cft		
BUCKETS TO FILL TRUCK	5 buckets		
LOADER TIME/TRUCK LOAD	2.75 min/truck		
NUMBER OF TRUCK LOADS	1510 loads		
TIME PER TRUCKLOAD	8.5 min		

M/027/007 8/5/96

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\* WELCOME TO HEAPREC - A TEMPLATE FOR HEAP LEACH \*

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OPTIMUM NUMBER OF TRU 4 trucks  
TIME PER TRUCK (80 PCT E 86.5 hrs/truck  
LOADER TIME AT 80 PCT EF 86.5 hrs  
---CAPPING HEAP, GRADING CLAY LAYER (3 of 7 pages)---

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DOZER TYPE D9N  
GRADED WIDTH 10 ft  
AVERAGE SPEED 1 mph  
AVERAGE PASS LENGTH 500 ft  
MANUEVER TIME 0.25 min  
OPERATING COST \$223.35 per hr  
LABOR COST \$25.70 per hr  
TRAVEL DISTANCE 79453 ft  
NUMBER OF PASSES 159 passes  
TOTAL TIME AT 80 PCT EFF 19.6 hrs

GRADING COST \$9,763

---CAPPING HEAP, CLAY COMPACTION WITH ROLLER (4 of 7 pages)---

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UNIT COST \$0.50 per cyd (range: \$0.35-0.50/cyd)  
(source: R-4, USFS, 1990)

COMPACTING COST \$14,714

M/027/007 8/5/96

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\* WELCOME TO HEAPREC - A TEMPLATE FOR HEAP LEACH \*  
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---CAPPING HEAP, CRUSHING MINE-RUN WASTE ROCK (5 of 7 pages)---

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CRUSHING COST (SCREENE \$4.00 cyd source:R4-USFS, 1990

COST \$176,563

---CAPPING HEAP, HAULING CRUSHED ROCK (6 of 7 pages)---

TRUCK TYPE D30D COST \$63,748

CAPACITY 19.5 cy

TRUCK SPEED 32 mph

MANEUVER,DUMP TIME 2 min

OPERATING COST \$103.85 per hr

LABOR COST \$20.70 per hr

LOADER TYPE 970F

CAPACITY 4.25 cy

LOAD,DUMP,MANEUVER TI 0.55 min

OPERATING COST \$92.15 per hr

M/027/007 8/5/96

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\* WELCOME TO HEAPREC - A TEMPLATE FOR HEAP LEACH \*

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LABOR COST	\$25.70 per hr
MATERIAL DENSITY	95 lb/cft
BUCKETS TO FILL TRUCK	5 buckets
LOADER TIME/TRUCK LOAD	2.75 min/truck
NUMBER OF TRUCK LOADS	2264 loads
TIME PER TRUCKLOAD	6.6 min
OPTIMUM NUMBER OF TRU	3 trucks
TIME PER TRUCK (80 PCT E	129.7 hrs/truck
LOADER TIME AT 80 PCT EF	129.7 hrs

---CAPPING HEAP, GRADING CRUSHED ROCK LAYER (7 of 7 pages)---

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DOZER TYPE	D9N
GRADED WIDTH	10 ft
AVERAGE SPEED	1 mph
AVERAGE PASS LENGTH	500 ft
MANUEVER TIME	0.25 min
OPERATING COST	\$223.35 per hr
LABOR COST	\$25.70 per hr
TRAVEL DISTANCE	79453 ft
NUMBER OF PASSES	159 passes
TOTAL TIME AT 80 PCT EFF	19.6 hrs

GRADING COST	\$13,112
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M/027/007 8/5/96

---SCRAPER - TOPSOIL APPLICATION (1 of 1 page)---

	FACILITIE	HEAPS	ROADS	PONDS
**HAUL DISTANCE	2640	2640	0	0 ft
**ACRES	23.28	18.24	0	0 ac
**TOPSOIL DEPTH	1	1	0	0 ft
SCRAPER TYPE	627F	627F	627F	627F
CAPACITY	17	17	17	17 cy
OPERATING COST	\$120.42	\$120.42	\$120.42	\$120.42 per hr
LABOR COST	\$25.70	\$25.70	\$25.70	\$25.70 per hr
PRODUCTION	181	181	340	340 cy/hr
TOTAL TIME AT 80 PCT EFF	259.4	203.2	0	0 hrs
=====	=====	=====	=====	=====
SCRAPER-TOPSOIL APP CO	\$37,904	\$29,692	\$0	\$0

↑  
"FACILITIES"  
COLUMN IS  
FOR TOPSOILING  
DUMPS

11/027/007 8/5/96

---DOZER - GRADING LEVEL AREAS, TOPSOIL (1 of 1 page)---

	FACILITIE	HEAPS	ROADS	PONDS
**ACREAGE	11.64	9.12	0	0 ac
DOZER TYPE	D9N	D9N	D9N	D9N
GRADED WIDTH	10	10	10	10 ft
AVERAGE SPEED	1	1	1	1 mph
AVERAGE PASS LENGTH	500	500	500	500 ft
MANUEVER TIME	0.25	0.25	0.25	0.25 min
OPERATING COST	\$223.35	\$223.35	\$223.35	\$223.35 per hr
LABOR COST	\$25.70	\$25.70	\$25.70	\$25.70 per hr
TRAVEL DISTANCE	50704	39727	0	0 ft
NUMBER OF PASSES	101	79	0	0 passes
TOTAL TIME AT 80 PCT EFF	12.5	9.8	0	0 hrs
DOZER-GRADE LEVEL COST	\$3,113	\$2,441	\$0	\$0

---DOZER - GRADING SLOPES, TOPSOIL (1 of 1 page)---

	FACILITIE	HEAPS	ROADS	PONDS
**SLOPE LENGTH	240	180	0	0 ft
**SLOPE WIDTH	2113	2207	0	0 ft
SLOPE AREA	11.6	9.1	0	0 ac
DOZER TYPE	D9N	D9N	D9N	D9N
GRADED WIDTH	10	10	10	10 ft
AVERAGE SPEED	1	1	1	1 mph
AVERAGE PASS LENGTH	240	180	0	0 ft
MANUEVER TIME	0.25	0.25	0.25	0.25 min
OPERATING COST	\$223.35	\$223.35	\$223.35	\$223.35 per hr
LABOR COST	\$25.70	\$25.70	\$25.70	\$25.70 per hr
TRAVEL DISTANCE	50530	39640	0	0 ft
NUMBER OF PASSES	211	220	ERR	ERR passes
TOTAL TIME AT 80 PCT EFF	13.1	10.5	ERR	ERR hrs
DOZER-GRADE SLOPES CO	\$3,263	\$2,615	\$0	\$0

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"FACILITIES"  
COLUMN  
IS FOR GRADING DUMPS